THE RELATIONSHIP BETWEEN THE MOVEMENTS OF CAPITAL MARKETS IN DEVELOPED ECONOMIES AND THEIR EMERGING MARKET COUNTERPARTS IN THE ASIAN PACIFIC REGION

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Abstrak

Kajian ini melihat semula perhubungan di antara bursa-bursa saham di negara-negara maju dengan bursa-bursa saham negara-negara membangun di Asia Pasifik. Pengkaji telah menggunakan indeks bursa-bursa Amerika Syarikat, Britain, Malaysia, Singapura, Tanah Besar China, Hong Kong, India, Jepun dan Australia untuk tahun-tahun 1997 sehingga 2003. Ujian-ujian Johansen, Granger and model pembetulan vektor telah digunakan untuk menentukan perhubungan jangka masa panjang dan pendek bursa-bursa saham yang telah disebutkan tadi. Kajian in mendapati bahawa bursa-bursa saham Asia amat peka kepada perubahan di Amerika Syarikat dan bukan kepada bursa-bursa saham negara-negara maju yang lain. Bursa-bursa saham Asia Tenggara amat peka kepada perubahan di rantau mereka dan juga di rantau-rantau lain berbanding dengan bursa-bursa yang lain. Bursa-bursa Tanah Besar China dalam jangka masa panjang tidak peka kepada perubahan kepada bursa-bursa lain. Pelabur-pelabur Asia kelihatan amat suka berspekulasi kerana perhubungan di antara kebanyakan bursa-bursa saham Asia kuat pada jangka masa pendek sahaja.

Abstract

This research revisits at the relationship between the movements of capital markets in developed economies and their emerging market counterparts in the Asian Pacific region using market indices of the American, British, Malaysian, Singaporean, Mainland Chinese, Hong Kong Special Administrative Region (SAR), Indian, Japanese and Australian markets for the periods 1997 to 2003. The Johansen's Cointegration Test, Granger Causality Test and Vector Correction Model Test were used to determine the long term and short term relationship between the markets. This study finds that the Asian markets are very much influenced by the events in the United States rather than other developed markets. Of all the markets surveyed, The South East Asian markets are the most sensitive towards events in their own region and regions outside themselves. Mainland China in the long run are not affected by events outside themselves. It is implied that Asian markets are rather speculative as most connections between bourses only happens in the short term.

Chapter 1

INTRODUCTION

1.1 Introduction

The relationship between the movements of capital markets in developed economies and their emerging market counterparts has been studied by many scholars especially in the West. Many studies center on the wisdom of market cointegration investments into emerging markets for example studies made by Platt (1998) and Glenn and Pinto (1994).

Although this issue of market cointegration has been investigated by many researchers many times before, the ever changing and connected world economy has resulted in researchers needing to revisit this topic from time to time. The ease of investing in another market through the internet, international fund managers opening their branches in new markets and the ease of getting information about investing in a foreign market are new developments to the science of investment thus prompting a revisit to the topic of market cointegration.

Cointegration as defined by Engle and Granger (1987) is *"a long run equilibrium relationship between variables."* In simple terms in this study, cointegration is the relationship between one market and another market.

Globalization and the liberation of markets have resulted in the ease of the exchange of capital funds between countries. Firstly, the cointegration between capital markets

is one of the offshoots of the cointegration of trade between nations. First, nations merely exchange goods and services. Secondly, companies manufacture and sell goods in their customer markets. Thirdly, companies manufacture goods in countries with relatively lower costs from their holding company. Portfolio investment comes about when investors want to invest in the company in the form of equity. For example Nestle S.A. of Switzerland started off manufacturing their products in Europe and Australia, later moving their some of their operations into Asia and listing in Asia. Nestle Malaysia Berhad is one offshoot of Nestle S.A. Because of the investment of the Nestle S.A. of Switzerland in the Malaysian bourse, the Malaysian bourse is somehow connected to the Swiss bourse – thus the first step towards cointegration.

Secondly, the phenomenon of the cointegration of markets came about due to cross listings of companies in different bourses. Sony of Japan for example is listed in the Tokyo Stock Exchange as well as in the New York Stock Exchange as an American Depository Receipt. Lang et al. (2002) noted that firms that cross-list on a more transparent bourse are valued more highly due to important changes that occur in the information environment of firms around cross-listing and that these changes are rewarded with higher valuations by the market. Investor protection and agency problems have been argued to be important to the cross-listing decision.

Rastogi (1997) in his study gave three major reasons why cointegration should be studied. Firstly, the 1970s to 1990s have seen a significant shift towards deregulation of trade and financial markets around the world, resulting in increased international capital flows. Secondly, advances in Information Communications Technology (ICT)

have provided the platform for tremendous growth in the scale and complexity of financial markets, thereby allowing international flows of funds. Lastly, innovations in the study of finance have produced an unprecedented number of innovations in securitization and derivatives.

The reasons given by Rastogi are why valid reasons researchers must study this subject.

1.2 Research Question

The main questions that will be answered in this study are:

a. Is there a relationship between the movements of capital markets in a developed economy and their counterparts in the Asia Pacific region?
b. Is there a relationship between the movements of one market in Asian sub region and with another in another sub region?
c. Is there a relationship between the movements of capital markets in the same sub region?

1.3 Research Objectives

The main objectives of this study are to find out:

a. Whether there is a relationship between the movements of the capital market in developed economies and their emerging counterparts especially those in the Asia Pacific region.
b. Whether there is a relationship between the movement of markets in one sub region and with another in a different sub region

c. Whether there is a relationship between the movement of one established market in one sub region and another market in the same sub region

By understanding the relationship between the local market and the international market, investors avert risk on their current portfolio. The first tenet of the portfolio theory is that investors avoid risk when investing. Movements in a foreign bourse become a signal for the local investor to relook their current investments and protect their portfolio from losses.

1.4 Significance of this study

The study will look at the following aspects which have not been covered or partially covered earlier studies

a) The level of cointegration of markets in Asia and their international counterparts after the financial crisis in 1997 such as American and Britain.

   Although most studies look at the periods during and before 1997, this study specifically looks at periods after the crisis i.e. 1997 to 2003. Daley (2003) for example looked at the relationship between the ASEAN markets and the developed markets up to 2001. Ong (2003) looked solely at the cointegration of the Singapore and the US market for periods up to 2003. This study adds value to the more recent studies as this study looks at the cointegration of a more varied range of markets in the Asia Pacific region.

b) How emerging markets in Asia such as Greater China and India are affected by movements in the stock market in the Asia Pacific region and by the developed markets.

Most studies again center on more developed markets such as Hong Kong and Singapore with the developed markets but this time some focus is given to emerging bourses such as in Shenzhen and Mumbai. Kim and Shin (2000) looked at the cointegration of the Greater China markets with each other. This study again will add value to the aforesaid study as this study looks at how the Greater China markets cointegrate with markets overseas, which up to now is still quite little.

1.5 Terminology and the Definition of variables

The following are terms used in this study as defined by the Oxford Reference Online :

a. Emerging markets

Stock exchanges in countries where investors are unused to trading.

These are mainly newly industrialized countries (NICs), such as Taiwan or Brazil, or newly liberalized economies, such as Hungary or Poland. Because of thin markets and lack of experience of both investors and market regulators, emerging markets are often even riskier than stock exchanges in countries where they have been long established.

b. Dragon markets

A colloquial name for the emerging markets and economies in the Pacific basin, including Indonesia, Malaysia, the Philippines, and Thailand.

d. Capital market

A market in which long-term capital is raised by industry and commerce, the government, and local authorities. The money comes from private investors, insurance companies, pension funds, and banks and is usually arranged by issuing houses and merchant banks. Stock exchanges are part of the capital market in that they provide a market for the shares and loan stocks that represent the capital once it has been raised. It is the presence and sophistication of their capital markets that distinguishes the industrial countries from the developing countries, in that this facility for raising industrial and commercial capital is either absent or rudimentary in the latter.

e. Developed countries

Countries whose GDP and exports contain a large share of industrial production. The list of countries which could be described as industrial is continually changing. The International Monetary Fund (IMF) uses the name for the group of mainly advanced economies included in the Organization for Economic Cooperation and Development (OECD). This group includes the United States, Canada, Japan, Turkey, Australia, New Zealand, and eighteen European countries; Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. This definition omits the newly industrialized countries (NICs), including Brazil, Korea, and Singapore, and the countries of the former Soviet Union and Central and Eastern Europe, of which several, including Russia and the Czech Republic, are heavily industrialized.

This definition will be used to identify countries under the category of developed economies in this study.

1.6 Possible contribution of this study

This study is more suited towards an investor who wants to invest his money in equities in the Asia Pacific region. Unlike other studies this study looks at the effect not only to the more well-known Asia Pacific bourses in Hong Kong, Australia and Japan but also the emerging ones such as the People's Republic of China and India.

By understanding well the patterns of cointegration, investors can protect their portfolio investment from any surges due to reactions to overseas markets. Speculators on the other hand can profit from arbitrage by moving their funds from country to country. The degree of linkages among the markets and the latest information is crucial for purpose of portfolio diversification. By revisiting the studies of market cointegration but having an Asian focus, we can try to see the validity of the various findings of the study of market cointegration on the Asian markets. The students of finance and investment can see how the methods and findings of earlier studies in the West be applied in an Asian perspective.

1.7 Organization of the thesis

This study comprises five chapters with this chapter as the introduction. In the next chapter, we will look at various literature done by earlier researchers on the study of market cointegration. In Chapter 3, we will look at the model, the hypothesis, the data set, the data collection method, analysis techniques and the expected findings of this research. In the fourth chapter, we shall analyze data set in order to answer the research question put forward in this chapter. In the fifth and final chapter, we will explain the results found in Chapter 4 and present a conclusion towards the finding made in this study.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

In this chapter, we will firstly introduce why the topic of the cointegration of markets needs to be revisited. Next we will look at works by earlier researchers looking at the connection between markets in the periods before and after the Asian Economic Crisis. Special focus will be placed on literature on this topic from an Asian perspective.

2.2 The need for studies on the cointegration of markets

Rastogi (1997) noted deregulation, technological advances and financial management innovations have caused a truly global market to form whereby what happens in one market will impact another. Rastogi listed three major forces at work in financial markets which have caused the international financial markets to cointegrate.

The 1970s to 1990s have seen a significant shift towards deregulation of trade and financial markets around the world, resulting in increased international capital flows. Advances in computing and communication technology have provided the platform for tremendous growth in the scale and complexity of financial markets, thereby allowing the international flows of funds. Innovations in the study of financial management have produced an unprecedented number of innovations in securitization and derivatives.

Rastogi is his report cited statistics put out by McKinsey & Co showing the ever increasing importance of portfolio investments from developed countries to developing countries.

Table 2.1: Portfolio investments from developed countries to developing countries

Source: McKinsey & Co. (amounts in U.S. dollars)

	1980	1992	2000
100% =	$11 trillion	$35 trillion	$83 trillion
Global			
Portfolio by Asset Class			
Cash	45%	32%	22%
Bonds	29%	39%	50%
Equity	26%	29%	28%
Global Portfolio by Geography			
Developed countries	100%	98%	93%
Developing countries		2%	7%

In fact the September 11, 2001 tragedy is a good and recent case study for showing how markets around the world cointegrate. The International Monetary Fund in their report surveying the effects of the tragedy of September 11, 2001 mentioned close cointegration between the developed economies and the emerging economies. The slowing down of the developed economies due to weakening prospects for trade and declining business and consumer confidence had a particularly strong impact on some sectors—especially information technology and tourism—to which many emerging markets are heavily exposed to. The weaknesses of those money earning sectors of the emerging economies have led to the decline in the financial markets of those nations.

Whatever the reason is, the study of the cointegration of markets is a tool in helping the investor diversify his portfolio and seek new opportunities.

2.3 Literature looking at the correlation between markets

This school of thought is quite widespread as compared to the school of thought studying at the effects of economic variables on the stock market in section 2.4.1. Most studies looking at the cointegration of markets use various correlation techniques to analyze this phenomenon. The techniques used maybe similar but researchers have found different results throughout time. To ease the understanding of various works, literature will be broken into studies before the 1997 Asian Economic Crisis, during the crisis and after the year 2000.

The logic behind this classification is that firstly markets were beginning to develop but not until the early 1990s where there significant portfolio transactions between both the Asia Pacific markets and with the world outside the Asia Pacific region as shown earlier by Rastogi in Table 1.

Secondly the amount of research between the two markets were not many and only focused on a few more developed Asian markets such as Japan, Hong Kong and Australia. Researchers were more interested in studying the Asia Pacific region after 2000. Most of their research centered on the events of the Asian Economic Crisis.

2.3.1 Literature studying periods before the Asian Economic Crisis

Works showing the connection between the performance of markets in emerging markets and the more developed peers have surfaced since the early 1990s. Glen and

Pinto (1994) mentioned that interest in emerging markets is due to growth rates in the emerging markets surpass those in most developed countries. Back then there is low correlation in financial performance between emerging markets and their developed nation peers due to the quantum of investments in emerging markets. In 1991, the gross capital flow from the United States to emerging markets was small i.e. only 2% of U.S. portfolio not big enough to create a correlation between both markets. Glen and Pinto identified the variables that affected the pricing of investments in the emerging markets. The pricing of capital market instruments are influenced by government policies in the countries of the capital, credit ratings, risk, control and disclosure. The market capitalization of all emerging markets combined is only a mere 92% of the British equity market back then. However the authors asked their readers to act with caution to the zealousness of investing in emerging markets by predicting that something that will have impact on the world economy will happen in the near future. The prophecy came true in the form of the Asian Economic Crisis in 1997.

Masih and Masih (2002) examined the patterns of dynamic linkages among the national stock prices of United States, Japan, United Kingdom, Germany, Australia, and Canada with particular reference to what impact the development of global markets (or the globalization phenomenon) had upon the leading stock markets, such as the US, Japan, and UK. They looked specifically at two periods in economic history i.e. the periods of ‘preglobalization’ (January 1972–December 1979) and ‘postglobalization’ (January 1984–June 1996). The presence of cointegration implies that since each national stock price series contains information which binds all the stock market prices together, the predictability of one country’s stock prices can be

enhanced significantly by utilizing information on another country's stock prices. However, during the postglobalization era, the Japanese stock market has become more independent in relation to the other five markets.

Knif and Pynnonen (1999) looked at cointegration from an Asian, American and European perspective by looking at the relationship between the American, Japanese, Hong Kong, British, French, Swiss, German, Dane, Finnish, Norwegian and Swedish markets between 1993 and 1996. They noted that American price changes have an impact on all other markets and affect their own results the following day.

2.3.1.1 Literature studying periods before the Asian Economic Crisis about Asia

Ang and Pohlman (1978) tried to see whether stocks in Asia follow or not follow the random walk process as proven by Fama (1965) on US stocks and Dryden (1969) on European Stocks. Ang and Pohlman hypothesizes that if a stock market is less organized than their organized counterparts in the US and Europe by having a lesser degree of regulations or disclosure requirements, these stock markets will exhibit a greater deviation from a random stock behavior. The researchers studied the Australian, Hong Kong, Japan, Philippines and Singapore markets between 1970 and 1974 and found that Far Eastern Stocks show greater standard deviation and which is a departure from the normal distribution of their US and European counterparts. There is hardly any cointegration between the Asian markets at that time.

Chan, et. al. (1992) examined the relationships among the stock markets in pre-handover Hong Kong, South Korea, Singapore, Taiwan, Japan and the United States

between 1983 and 1987. Chan et. al. noted that there is no evidence of the cointegration among the stock prices on the above mentioned countries.

Climent and Meneu (2003) looked at the effects of the crisis on the relationships of the South East Asian stock markets with the stock markets in Europe, North America, and Latin America. The researchers used the cointegration test, vector auto regression analysis, forecast error variance decomposition (FEVD), and impulse–response relationships to analyze the data from the Morgan Stanley national and international indices (MSCI). Climent and Meneu noted that to predict the movements in the South East Asian markets, the United States is the best market to use.

After the Asian crisis period, the cointegration between the United States markets and markets outside South East Asia became clearer. The cointegration between the Asian and the international stock markets has increased after the crisis while the contagion effect (i.e. the reaction between one capital market to news of another) shows the dynamic relationships between international stock markets.

Dornau (1999) looked at the interrelationship between the returns of the Nikkei 225, the DAX and the Dow Jones Industrial index between 1985 and 1997. Dornau noted that there is causality between the American markets with the other two markets and vice versa. However the influences of the Japanese and German bourses on the American bourse become weaker through time.

2.3.1.1.1 Literature studying periods before the Asian Economic Crisis north Asia specific

Huang et. al. (2000) explored the causality and cointegration relationships among the stock markets of the United States, Japan and the South China Growth Triangle (SCGT) region i.e. Hong Kong, Shanghai, Shenzhen and Taiwan and noted over the period of October 2, 1992 to June 30, 1997 that there is no cointegration among these markets except for that between Shanghai and Shenzhen. We can imply that except for Shanghai and Shenzhen, the results of one Greater Chinese markets is not a good predictor of the results of another Greater Chinese market in the long run.

Kim and Shin (2000) looked at interactions between the different indices in the People's Republic of China (including Hong Kong). They noted that Shenzhen and Shanghai B Shares influence the performance of other shares in the bourse. Since 1996 (a year before the handover), China B Shares have a tendency to lead the performance of the H Shares in Hong Kong.

2.3.1.1.2 Literature studying periods before the Asian Economic Crisis about South East Asia specific

Maysami and Koh (2000) examined the long-term equilibrium relationships between the Singapore stock index and selected macroeconomic variables, together with the stock indices of Singapore, Japan, and the United States for the periods January 1988 to January 1995, and noted that the Singapore stock market is significantly and positively cointegrated with stock markets of Japan and the United States.

Roca et. at (1998) studied the interdependence of the ASEAN-5 equity markets (i.e. Malaysia, Thailand, Singapore, the Philippines and Indonesia) and noted that in the long term markets are not significantly linked but the reverse in the short-term whereby the markets are linked with the exception of Indonesia. Malaysia is the most influential market in the region but Singapore and Thailand have the greatest linkage with Malaysia and the Philippines.

2.3.2 Literature studying periods during and the aftermath the Asian Economic Crisis

The Asian Financial Crisis has caused many investors to rethink and question the logic about investing in emerging markets. Yi Feng (2000) differs from Strosnider (1978) as government control was the reason why China, India and Vietnam remain unscathed by the economic crisis simply because their financial systems remain under government control. These countries relied on foreign direct investment rather than portfolio investment for financing. An open financial market system can invite investment capital but also speculative capital causing financial instability. George and Prabhu (2000) agree that the desire for quick monetary returns have resulted in few venture capitalists wanting to invest in long-term projects especially those dealing with infrastructure development. This resulted in the government taking large equity stakes in those ventures. We can imply here that if investors do not want to commit long term capital in a certain country, we can expect a low level of market cointegration between the investor's home market and the emerging market.

Studies in the early 1990s earlier mentioned that there is a weak correlation between the indices of the emerging markets with their developed counterparts. This line of thought has changed in the late 1990s and in the new millennium. Koutmos and Saidi (2001) mentioned that by 1995 there are studies that show that technical signals from US markets do effect predictions of performances in Asian Pacific stock markets apart from technical signals from the their markets themselves. Koutmos and Said noted the following behavior when studying 6 Asian markets (i.e. Hong Kong, Malaysia, the Philippines, Singapore, Taiwan and Thailand)

Yang et. al. (2003) were more ambitious as they examined the stability of long-run relationships between a number of emerging stock markets in Latin American (i.e., Argentina, Brazil, Chile, and Mexico), Asia (i.e., India, South Korea, and Thailand) , Europe (i.e., Greece), and Africa emerging market (i.e., Zimbabwe). and the US market. No long-run relationship existed between emerging stock markets and the US until 1997. The existence of a long-run relationship with the US stock market was found for most countries during the 1997–1998 Asian Financial Crisis.

2.3.2.1 Literature studying periods during and the aftermath the Asian Economic Crisis about the Asia Pacific region

Chatterjee (2000) studied the daily equity indices of both the North American markets and the ASEAN markets to analyze impact of the NAFTA markets on the ASEAN markets. The author concludes that the advent and eventual ratification of NAFTA has significant effect on the equity index returns of two distant trading blocks i.e. ASEAN and NAFTA. The study looked at US, Mexico and Canada as the NAFTA block and ASEAN-5 as the ASEAN block.

The significant F-statistics for Canada, Mexico and US validate the inclusion of lead-lag variables and event windows into the analysis. While the result indicates some evidence for the existence of NAFTA effect on North American countries, it is certainly not a pervasive and systematic impact, and appears to be random in nature.

The overall NAFTA effect is observed to be significant to all North American markets and four ASEAN markets i.e. Malaysia, Thailand, Indonesia and Philippines. Only Singapore is the odd one out.

However the systematic impact of one single event happening in one member country affecting other member countries and countries outside the block could not be proven.

Anurou (2003) studied the degree of integration among Asian equity markets especially aftermath of Asian Economic Crisis. The researcher found out that there are significant stock market linkages among the emerging equity markets of Hong Kong, India, South Korea, Malaysia, Singapore and Thailand between 1998 and 1999. No country in the region is insulated from capital market movements in another neighboring Asian country. In fact during the early 1990s Singapore and the US had causal effect on the markets of Asian region. This result differs from the study made by Chatterjee three years earlier.

The major conclusions made were:

a) Singapore Straits Times index exert the strongest causal influence on all of the newly industrialized economies with the exception of Hang Seng and the Indian indices
b) Singapore is the only new industrialized country that exerts a causal influence on both Japan and the US indices

c) the other Asian markets with the exception of Malaysia, exert some one-way, as well as bi-directional, causality relationships among themselves

d) the bourses of Hong Kong, India, Korea, Malaysia and Thailand react to most of the changes in the Singapore bourse within zero to three trading days

Ong et. al. (2003) studied the correlation between the Singapore's Straits Times Index and the US Standard and Poor 500. The S&P 500 and the Straits Times Index (STI) were chosen for the study because of the accuracy in market representation of both markets and the widespread use of both indices as benchmarks. The authors hypothesized that since Singapore and the US have close trade exchanges it is normal that the bourses in both countries have a close relationship. Both bourses only showed a moderate coefficient of correlation of 0.584 from 1988 to 2003. By dissecting the time frame into 3 distinct time periods, the authors found the following:

a) February 1988 to 1997

   Both countries enjoyed high rates of economic growth and both bourses aforesaid had a high correlation of 0.872

b) February 1997 to February 2000

   This is the period where most of Asia fell into the Asian Financial Crisis. The Singapore bourse was dragged down along with other Asian Stocks. From the above statement by the authors, we can conclude that there is cointegration between the various markets in Asia. The US bourse was unaffected by the crisis and instead it rose in the period mentioned. The correlation between US and Singapore was only 0.273. The crisis barely affected the US.

c) February 2000 to February 2003

Both markets moved downwards in a highly correlated manner with a coefficient of 0.906. This was the time of the burst and aftermath of the Internet bubble.

Cross listing is one the reasons bourses and two or more countries are interconnected. Lang et al. (2002) looked the reasons why companies cross list in the New York Stock Exchange. The researchers found out that

a) Non-U.S. firms that cross list enjoy greater analyst coverage and increased forecast accuracy relative to other firms in their country that are not cross-listed in a foreign bourse.
b) Change in analyst coverage and forecast accuracy occurs around the cross-listing period. This double confirms any opinion about the company, thus resulting in greater confidence when investing in the stock.
c) Firms that are cross listed in a foreign bourse that have more analyst coverage and higher forecast accuracy have a higher valuation.
d) Firms with greater improvements in information environment due to cross listing experience larger increases in valuations due to improved corporate governance.

Daley (2003) looked at the static and dynamic independence of the stock markets of ASEAN-5 and the markets of Australia, Germany and the United States between 1990 and 2001. His study revealed an increase in cointegration between the markets only after the Asian Financial Crisis.

2.4 Literature looking at the cointegration of capital markets as a response of the underlying economic factors between different countries.

The literature looking at the cointegration of capital markets as a response of the underlying economic factors between different countries is not many perhaps due to the complexity of the models looked into. In this section, economic issues such as industrial production, unemployment and transparency affect the prices of stocks internationally.

Gilmore (2003) tested the efficiency of the Czech, Hungarian and Polish markets. She theorized whether these markets have moved toward efficiency as they have introduced regulatory and institutional frameworks similar to those of more developed countries. In her model she mentioned that the privatization strategies of the government, the level of accounting disclosures and barriers of foreign ownership are determinants of the levels of portfolio investments in those countries. She noted at the end of the study that there is lack of cointegration between the 3 markets aforesaid is because of the differences in privatization methods, the relatively low level of economic integration between the countries as seen by their low mutual trade volumes, and the different economic environments in the countries mentioned.

The issue of the whether there is a relationship between the emerging capital markets and their developed counterparts have evolved through time. There was hardly any correlation between markets from studies in the early 1990s but from studies done post Asian Financial Crisis detected a strong relationship between the markets. The need to diversify one's portfolio from the market risk on his country meant the investor had to place his money in another country for this means. However these good intentions were overshadowed by the desire to earn quick market gains resulting

in speculative funds entering the markets especially in Asia. These events lead to the start of the Asian Economic Crisis in 1997.

2.4.1 Literature looking at the cointegration of capital markets as a response of the underlying economic factors between different countries in Asia

Abdul Ghani (1994) investigated the effects of macroeconomic variables on stock prices in the USA, United Kingdom, Germany (that time West Germany), France, Norway, Japan, Singapore, Malaysia, Australia and South Africa. The macro-economic variables used in this study represent the major economic activities in each of the countries surveyed.

Five economic variables that Abdul Ghani (1994) used to explain movements in the aforesaid stock markets were:

a) US Industrial Production
b) French unemployment
c) Australian unemployment.
d) Singapore exports
e) Japanese money supply

The critique of this method is that importance of the different economic variables varies from country to country and from time to time. In the study, market returns and economic variables were divided into two sub periods i.e. January 1980 to December 1983 and January 1984 to December 1987. Different economic variable factors and market return factors were placed in the different periods surveyed. Unlike the analysis techniques mentioned in section 2.3, economic variables were included as part of the analysis to look at the cointegration of markets.

Phylaktis (1997) used the approach of studying the movements of real interest rate when looking at the co-integration of the Asia Pacific capital markets between the periods 1980 to 1993. She used the cointegration and the error correction models and drew inferences on the degree of capital market integration by looking at the speed of adjustment of real interest rates following a shock. She found that there had been an increase in capital market integration with both the United States and Japan during the 1980s. Except for Malaysia, Japan has not overtaken the United States in dominating the financial markets of these countries. Capital market integration is found to be greater in Singapore, Hong Kong and the Republic of China. Surprisingly the researcher found that Japan has the lowest level of cointegration with the United States.

Countries in the Asia Pacific region have attempted to promote economic efficiency by taking steps to liberalize their domestic financial systems and remove restrictions in international capital flows. The former British colony Hong Kong and Singapore began liberalizing their financial systems by removing or relaxing interest rate regulations and abolishing exchange controls in the mid 1970s, Japan and Malaysia in the late 1970s, and South Korea and the Republic Of China in the second half of the 1980s. Although the timing and extent of liberalization varied across the various countries, countries in the region have allowed domestic and foreign market forces to play a greater role in their financial markets resulting in the cointegration of Asia Pacific capital markets with the rest of the world. Phylaktis warned that if financial markets are highly integrated, a given country's economy cannot be effectively insulated from foreign influences. This prophecy came true two months after her study was published with the Asian Financial Crisis in July 1997.

Leong and Felmingham (2003) studied the degree of interdependence among the share markets of the five more developed economies in the East Asian region mainly Japan, Singapore, Hong Kong, South Korea and the Republic of China. Leong and Felmingham chose those markets as the five developed economy share markets provide a significant channel for Foreign Direct Investment and portfolio investment to the emerging countries of the Asia Pacific region. The combination of the Hong Kong, Republic of China, Japan and Singapore accounted for 83% of Mainland China's inward Foreign Direct Investment between 1979 and 1993.

The significance of the interdependence of the five East Asian markets is based on the following principles.

Firstly, Investors in East Asian share markets will have less opportunity for risk diversification within the mentioned group i.e. the degree of interdependence among the markets mentioned becomes greater.

Secondly, the interdependence between the five markets will influence the nature of the regional response to common shocks affecting share markets in the Asia Pacific region.

Thirdly, the presence of causal effects within the aforesaid Asian group of share markets inferred that the individual markets are inefficient, because the cointegration or causal links are unlikely to be observed in efficient markets.

The researcher noted the following

a) The correlation of the five indices i.e. Nikkei 225 and the other four bourses strengthened following the Asian Financial Crisis in June 1997
b) The Nikkei 225 has a long-run equilibrium relationship with the Korea's composite, the Taiwan Weighted, the Singapore Straits Times and Hang Seng indices.
c) The Straits Times Index and the Korea Composite index pair and the Taiwan and Hang Seng pair are cointegrated.

Bachman et. at. (1996) examined the cointegration properties of the stock prices of the G-7 countries i.e. Canada, France, West Germany, Italy, Japan, the United Kingdom and the United States to determine the common trend in stock prices for the periods January 1970 to February 1989. The hypotheses tested included technological change, trade liberalization, and financial deregulation. They found that none of the three macroeconomic hypotheses mentioned are consistent with all tests. The causes for the findings are

a) The relaxation of financial capital controls of the late 1970s and early 1980s resulted cointegration between the European markets. This was because of the relaxation of trade barriers by the then European Community creating capital flows among European countries
b) That the United States is assumed as the principal source of technology, and is not bilaterally cointegrated with any other country in the survey.

Caporale et. al. (2002) noted that there is a connection between interest rates and the stock market. Pre-Asian Crisis stock prices lead positively interest rates in Indonesia and Thailand while behaving the opposite manner in Japan and South Korea.